FAA | AVIATION NEWS

JULY 1964

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FAA | AVIATION NEWS

F E D E R A L A V I A T I O N A G E N C Y

VOL. 3, NO. 3 JULY 1964

COVER

King Airs, Beech's newest twin turbine-powered executive aircraft, take to the skies after FAA certification. *See pages 8-9.*

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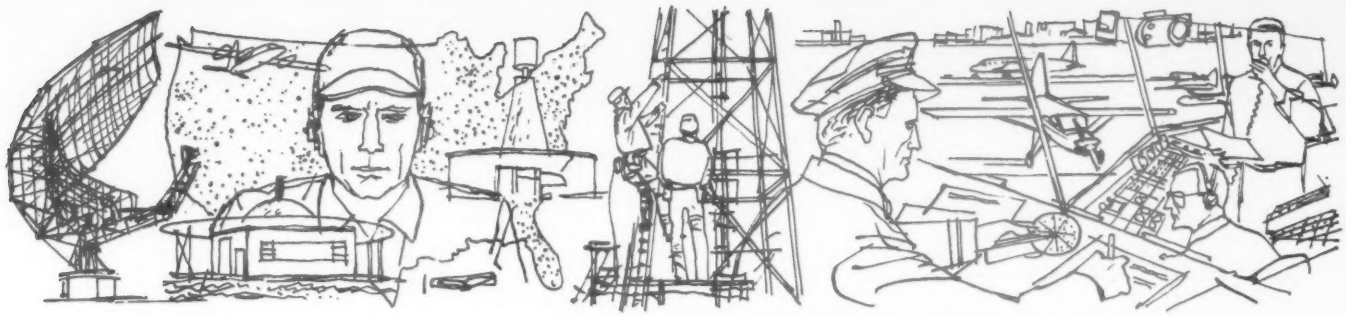


FAA CONSIDERS DESIGN CONTRACTS FOR DC-3 REPLACEMENT

Up to three manufacturers may be offered contracts by the FAA early in July to prepare detailed design specifications for a short haul aircraft to succeed the 29-year old Douglas DC-3.

Each manufacturer selected would be awarded a contract not to exceed $100,000. A deadline of Nov. 1, 1964, has been set for submission of the detailed specifications.

Nine firms, seven United States and two French aircraft manufacturers, have submitted proposals to the FAA for the development of a DC-3 replacement:

Lear Jet Corp., Wichita, Kans.; Hughes Tool Co., Aircraft Division, Culver City, Calif.; Republic Aviation Corp., Farmingdale, N.Y.; Jerome J. Witte, Parkville, Mo.; Fairchild Stratos Corp., Hagerstown, Md.; J. Morrow, St. Augustine, Fla.; Air Craft Marine Engineering Corp., Van Nuys, Calif.; Nord Aviation, Seine, France; and Establissements Henry Potez, Paris, France.

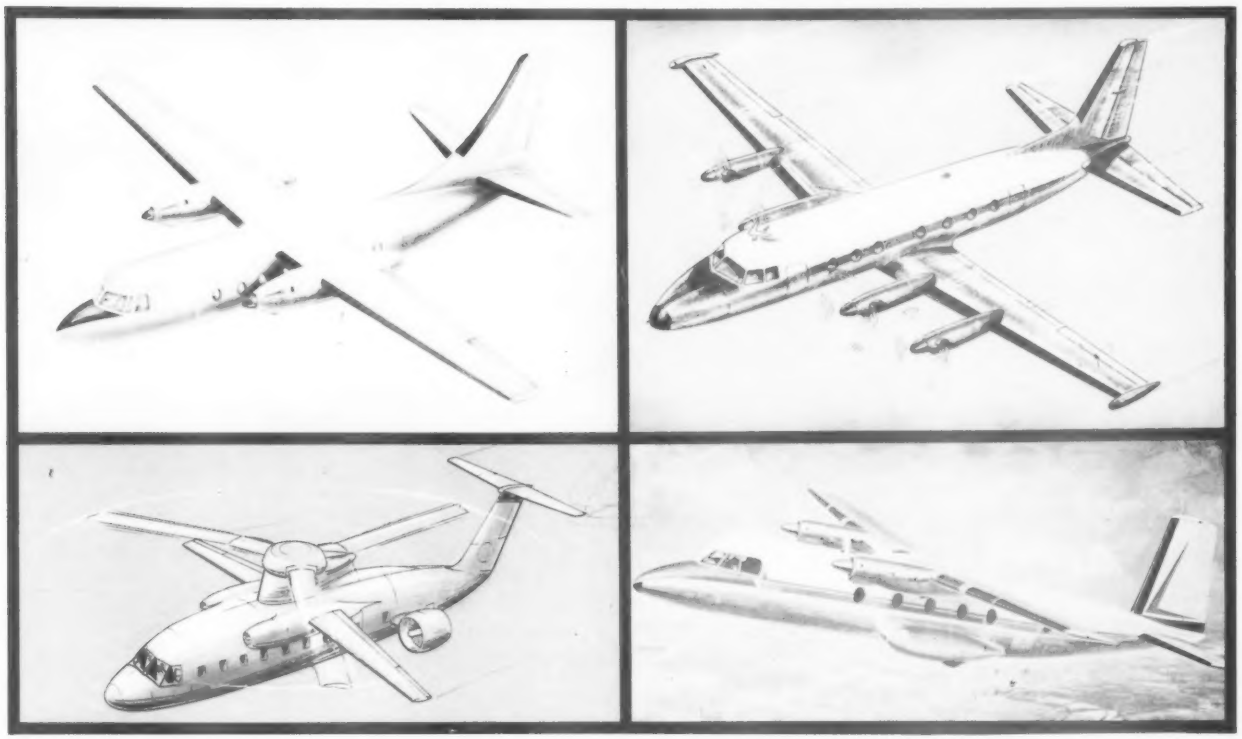
The design evaluation is being conducted by a 50-man team including representatives of the FAA, National Aeronautics and Space Administration, Civil Aeronautics Board, Department of Defense, and Department of Commerce. Officials of local service airlines will also evaluate the design proposals.

Airframe manufacturers who have not already submitted proposals, may still submit detailed specifications prior to the Nov. 1 deadline. These designs will be evaluated along with those selected as a result of the RFP.

An economic survey of domestic and world markets for a short haul transport made by the Systems Analysis and Research Corp., Washington, D.C., under FAA contract, revealed that a modern short haul aircraft will give the 13 local service carriers in the United States favorable operating results. The aircraft could have a market potential in the U.S. local service carrier industry from 303 to 482 units by 1975, as well as considerable sales overseas.

Design objectives outlined in the RFP specify the passenger capacity shall be from 14 to 30, as determined by the offerer, shall be able to cruise at least 200 miles per hour, and shall be able to operate from airports with 3,000 foot runways. The propulsion system should consist of at least two turbine engines of minimum size, noise, cost and complexity, and provide maximum reliability.

These are some of the design proposals submitted in the short haul transport competition.



CHAPTER TITLED 'ALPHANUMERICS' IS ADDED TO HISTORY OF RADAR

A new chapter in the history of radar is now unfolding. Titled "alphanumerics," the chapter opens with the installation of equipment in the Atlanta tower this month. Hopefully, operational evaluation will begin in the fall.

Installation of alphanumeric equipment is also beginning in the FAA Indianapolis center with operational evaluation planned for next spring.

Alphanumerics—letter-numbers providing aircraft identification and altitude on the scope of the controller—is hard to recognize as a relative of simple radar, an acronym formed from the words RAdio Detection And Ranging.

It was back in the '30s when the U.S. Navy began using radar to assist in steering ships through heavy fog, and to warn against the approach of other sea-going vessels. The first successful operation of a complete radar system displaying echoes on a cathode ray tube was in April 1936. The first operational use aboard a U.S. Navy ship took place in January 1939.

However, it was not until after World War II that radar was sufficiently developed and refined to be used in air traffic control. Chicago Midway, Washington National and Indianapolis Airports all began using radar on an experimental basis in 1947, but it was not until 1952, just 12 years ago, that radar was first officially approved as a tool for the control of air traffic.

The arrival of radar should have been an important occasion, but few people appreciated its potential.

Long before radar was used for approach, departure and en route control, it was used in another form, initially by U.S. military forces and later by the CAA, as Precision Approach Radar (PAR) for Ground Controlled Approaches (GCA).

PAR is used only as a means of directing aircraft on or near the final approach to a runway, while Airport Surveillance Radar (ASR) and Air Route Surveillance Radar (ARSR) are the real backbone of the air traffic control system. These radar have, of course, gone through many changes and the new ASR-5 and ARSR-2 bear only a slight resemblance to their predecessors because of technological improvements.

Airport and en route radars in turn have been enhanced by a secondary radar beacon system (ATCRBS) which reinforces target return and opens the door for alphanumerics, the automatic transmission of information from the aircraft and from a computer directly into the radar system for display on the controller's radar scope. The numbers and letters representing the altitude and the identity of the aircraft appear as a "license tag" which accompanies the blip as it moves across the face of the scope.

Here are some significant dates in the history of radar:

April 1947—Chicago Midway, GCA, operational but used only experimentally; not available for emergency use *(Airman's Guide)*.

April 1947—Washington National, same as above *(Airman's Guide)*.

April 1947—CAA granted first approval of Army wartime GCA radar for commercial planes, authorizing its use by Pan American World Airways only at Gander, Newfoundland (U. S. Air Force).

April 1947—Indianapolis, GCA stationed on airport, not remoted to tower cab *(Airman's Guide)*.

July 1947—Midway, Washington and Indianapolis GCA's all commissioned for emergency use *(Airman's Guide)*.

February 1948—First radar procedures handbook for controllers, *Operating Procedures for Control Tower Surveillance Radar and Ground Controlled Approach*.

February 1949—General authorization from CAA for commercial planes to use GCA radar as a primary aid for landings in bad weather (U. S. Air Force).

September 1950—Midway ASR-1 and PAR-1 placed in full time operation. ASR-1 for experimental use only *(Airman's Guide)*.

January 1952—Washington National Radar Departure Control initiated *(Airman's Guide)*.

July 1952—Washington National Radar Approach Control initiated *(Airman's Guide)*.

July 1952—First entry of Radar Procedures for Control of Air Traffic in *Federal Register*. ANC/PCAT to be the standard manual (FR Doc. No. 52-7605).

December 1952—Chicago Midway Radar Approach Control initiated *(Airman's Guide)*.

May 1953—Radar traffic control procedures entered in *Flight Information Manual*.

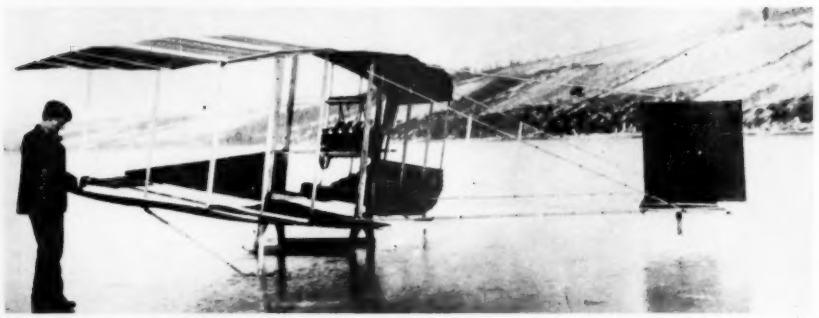
September 1958 — Evaluation of Air Traffic Control Radar Beacon System (ATCRBS) began at LaGuardia, Idlewild and Newark towers and New York center *(Airman's Guide)*.

September 1959 — ATCRBS commissioned at above locations *(Airman's Guide)*.

April 1959—First Airport Surface Detection Equipment Radar (ASDE) installed at Idlewild.

July 1964—Advanced Air Traffic Control System (ARTS) to begin at Atlanta tower as an evaluation of semi-automatic terminal ATC system.

MILESTONES IN AVIATION



The *Red Wing* above was the first airplane produced by the Aerial Experiment Association (AEA), a group which did much to foster aviation in the United States. The airplane received its name from the red coloring of its silk-covered surfaces.

On March 12, 1908, the *Red Wing* was flown for the first time. Taking off from frozen Keuka Lake near Hammondsport, N.Y., it flew 319 feet. The biplane was equipped with a sleigh-type undercarriage, had a Curtiss-designed 40-h.p., air-cooled engine and, unlike the other three AEA airplanes that followed, had no lateral controls. A pointed nose covered with red silk and fitted with an ordinary kitchen chair with the legs sawed off, served as the cockpit.

A Canadian, Frederick "Casey" Baldwin, piloted the airplane during its brief life span. Designed by Lt. Thomas Selfridge, it was destroyed when it crashed on its second flight.

Realignment of ARTC Centers Nears Completion This Summer

Consolidation and realignment of the nation's air route traffic control center (ARTCC) boundries will near completion in July and August when centers at Detroit, St. Louis and Phoenix are merged with adjacent facilities.

The Federal Aviation Agency program will result in a reduction of 450 personnel and a savings estimated at $100 million over a period of 16 years.

ARTCCs direct all aircraft operating IFR (Instrument Flight Rules) by providing separation service so that each aircraft can in effect, fly in its own reserved block of airspace. Approximately 300 persons—primarily air traffic controllers and electronic engineers and technicians —are required to staff each center.

The St. Louis center was deactivated on July 1, the Detroit center on July 5, and the Phoenix center will be deactivated on Aug. 20. The airspace formerly controlled by these centers will be transferred to Kansas City, Cleveland and Albuquerque, respectively.

The final step in the program will be the merger of the New Orleans and San Antonio centers into a new facility at Houston which is now under construction and scheduled to become operational in July 1965.

These and previous changes will reduce the number of centers in the contiguous 48 states from 29 in October 1962 to 21 next summer.

The 21 centers remaining when the merger program is completed next year will be Albuquerque, Atlanta, Boston, Chicago, Cleveland, Denver, Fort Worth, Houston, Great Falls, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Miami, Minneapolis, New York, Oakland, Salt Lake City, Seattle and Washington, D.C.

FOUR CONTRACTS AWARDED FOR DESIGN OF SST

FAA Administrator N. E. Halaby holds contracts totaling $22 million awarded to two engine and two airframe manufacturers for continued design work in the development program for the supersonic airliner. Looking on, seated, are Turner A. Simms, left, of Pratt & Whitney, and Gordon M. Bain, FAA Deputy Administrator for Supersonic Transport Development. Standing, from the left, Vernon Johnson, Lockheed Aircraft; George McTigue, General Electric, and Robert J. Murphy, Jr., Boeing Co.

Contracts have been awarded by the FAA to two airframe and two engine manufacturers to continue their efforts to achieve optimum designs for a United States supersonic transport plane, Administrator N. E. Halaby announced last month.

President Johnson had directed the negotiation of these contracts.

The airframe manufacturing companies are The Boeing Co. and Lockheed Aircraft Corp. The engine companies are General Electric and Pratt & Whitney Division of United Aircraft Corp.

Each airframe contract totals $6 million. The government cost-share is $4.5 million and the company cost-share $1.5 million in each case.

Each engine contract totals $5 million. The government cost-share is $3.75 million and the company cost-share $1.25 million in each case.

The four contracts run for six months, from June 1 to Nov. 30.

In directing government agencies to implement the program that was recommended by the President's Advisory Committee on Supersonic Transport, the Chief Executive said, "If we all work together, I am confident that this country will produce a supersonic transport that will continue to maintain American world leadership in the air."

Meanwhile, the number of reserved positions for supersonic transport stood at 91 at the end of June. Advance royalty payments totaling $9.1 million have now been submitted by 13 foreign and seven U.S. flag airlines, plus one aircraft leasing company.

HERCULES Becomes Civilian

The Lockheed Hercules C-130, which has already flown more than a million and a half hours in military service, was granted FAA's Class One Provisional Type Certificate last month. This permits the manufacturer to take the aircraft on a 'round-the-world tour. The prop-jet C-130 can carry a 40-foot long railway-truck van that is eight feet high and eight feet wide.

WOMEN'S GROUP PROPOSALS STUDIED BY AGENCY

WACOAs in the FAA headquarters lobby in Washington include, from the left, first row—Page Shamburger, Dorothy Young, Betty Gillies, Jerrie Mock, Virginia Britt; second row—Frances Nolde, Alice Hammond, Mildred Alford, Julia Short, Catherine Hiller; third row—Charlotte Kelley, Katharine Stinson, Betty Miller, Blanche Noyes, Nona Quarles, Jean Howard; fourth row—Gini Richardson, Jean Pearson, Bernice Steadman, Louise Hyde, Jerrie Cobb, Janey Hart, Eunice Naylor, Jimmie Kolp; fifth row—Dora Dougherty, Gene Nora Stumbough, Jacqueline Joo, Billie Timm, Connie Wolf, Louise Smith.

Fifteen recommendations drawn up by the Women's Advisory Committee on Aviation (WACOA) at an initial three-day meeting in Washington in May are now under consideration by the FAA.

One of the proposals was for a review of existing and proposed *Federal Aviation Regulations* pertaining to pilot training and flight training facilities. The group also recommended that the interpretation and enforcement by FAA personnel be standardized throughout the country in the area of flight standards; that current research projects include the total cockpit, not only the instrument panel as now proposed in "Project Little Guy," and that every airport used by jets and scheduled air carriers should have a secondary parallel runway 3,500 to 5,000 feet.

The 32-woman committee, headed by Mrs. Janey Hart and Miss Jean Ross Howard, will meet this fall at the FAA Aeronautical Center, Oklahoma City.

Aviation Mechanic Award Blanks Are Now Available

Entry blanks for the Second Annual Aviation Mechanics Award competition are now available at airports, maintenance shops and FAA district and maintenance inspection offices. The entry blanks, FAA Form 3338, may for the first time be submitted by eligible mechanics directly, or by their supervisors or others familiar with the mechanic's work. These forms should be submitted to the FAA district office having jurisdiction over the geographic area in which the mechanic is employed.

The awards program, a joint effort of the FAA, the Flight Safety Foundation and the aviation community, gives recognition to aviation mechanics who make outstanding contributions to air safety.

Sixteen finalists in both general aviation and air carrier maintenance categories will be selected, one from each group, from the eight FAA regions. General aviation mechanics will also be eligible for a state award.

Two national finalists will be selected from the 16 regional winners by a committee of FAA personnel, nationally-prominent aviation personalities and the Flight Safety Foundation.

State awards will be presented in October and regional awards in November.

The two national awards, one for each category, will be a specially-created medallion donated by American Aviation Publications, Inc.

Deadline for submission of all entries is Sept. 1.

European Pilots To See America On Fly-It-Yourself Air Tours

Some 100 Western European pilots and their families are scheduled to participate in two "fly-it-yourself" air tours of the United States July 8-28 and Aug. 7-25.

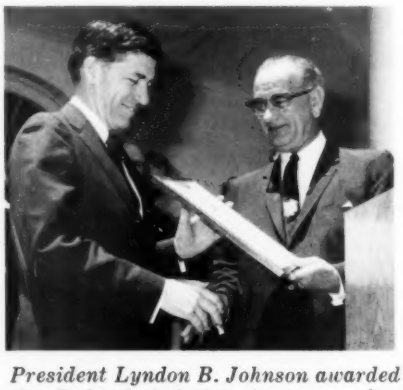
The first group is to meet at Dulles International Airport July 8 where they will pick up Cherokee 235 aircraft, from the Piper Aircraft Corp., Lock Haven, Pa. After a weather briefing by FAA, a navigation en route briefing by Piper Aircraft Corp., and a familiarization flight in the Cherokees, the fliers will depart on July 10 for Detroit, the first stop on their tour of the U.S.

The itinerary includes overnight stops at Chicago, Rapid City, S.D., Salt Lake City, Reno, San Francisco, Los Angeles, Phoenix, Carlsbad, N.M., Dallas, New Orleans, Atlanta, and New York.

Special purpose pilot certificates to fly registered U.S. aircraft in this country were issued to the European group on the basis of their foreign pilot certificates, physical qualifications and successful completion of an FAA examination of flight rules.

Special examinations for the pilots were held in May during the international meeting of the Association Proprietaire Pilots Aeronef at Cannes, France. FAA's European office set up the arrangements for the examination.

CITED FOR SAFETY



President Lyndon B. Johnson awarded the Federal Aviation Agency a citation for its work in the advancement of accident prevention among its employees for the year 1963. Administrator N. E. Halaby accepted the President's safety Award, Honorable Mention, in ceremonies held in the White House rose garden this spring.

Voiceprints Provide New Technique For Investigators

The hallmark of tomorrow's scientific detective with a talent for deduction may well be the tape recorder instead of the magnifying glass. Utterances, reduced to voiceprints, are turning out to be as significant and as revealing as fingerprints, and even more unalterable.

The value of recording conversations made in airplane cockpits was pointed up following a careful analysis of the final words from the cabin of the Pacific Air Lines plane that crashed near San Ramon, Calif., May 7, 1964, killing 44 persons. A revolver was found in the wreckage.

The recording of the plane's final conversation with the FAA control tower at Oakland was difficult to understand. As a public service, Bell Telephone Laboratories at Murray Hill, N.J., made a scientific analysis of the tape for the CAB. The final words were: "Skipper's shot. We're ben *shot*. (I was) tryin' ta *help*." Some words are misspelled to be as similar as possible to the recorded utterance. "I was" is in parenthesis to emphasize uncertainty. The words "shot" and "help" carry "the highest confidence weight."

There is a clear indication that the statement was made by the co-pilot, Ray E. Andress, shortly before the crash, instead of by the pilot, Capt. Ernest A. Clark, as suggested by early accounts. The Bell study compared the tape with previous recordings of the men.

"This determination seems relatively certain," according to L. G. Kersta of the Acoustics and Speech Research Laboratory at Bell, "because the voices of the pilot and the co-pilot were spectrally quite different."

A modern Sherlock Homes, Kersta explained that a human voice is so distinctive that it may someday be used like fingerprints for identification purposes.

Voiceprints, he said, are little "pictures" of one word of a person's speech. The pictures reveal the patterns of voice energy in the various levels of pitch—patterns that are quite distinctive and identifiable. These visible prints disclose fundamental patterns that seem to be more distinctive to the eye than to the ear.

The natural shape and size of a person's mouth, throat and nasal cavities cause a person's voice energy to be concentrated into bands of frequencies. The pattern—but not the exact configuration—of these bands remains essentially the same even when a person attempts to disguise his voice by lowering or raising the pitch, speaking in a whisper, muffling the voice or affecting an accent.

Kersta's Doctor Watson in one demonstration was television ventriloquist Shari Lewis and her variously-toned animals, Lamb Chop and Charlie Horse. The voiceprints were seen to be identical in their basic design when Miss Lewis was speaking the same words in different roles.

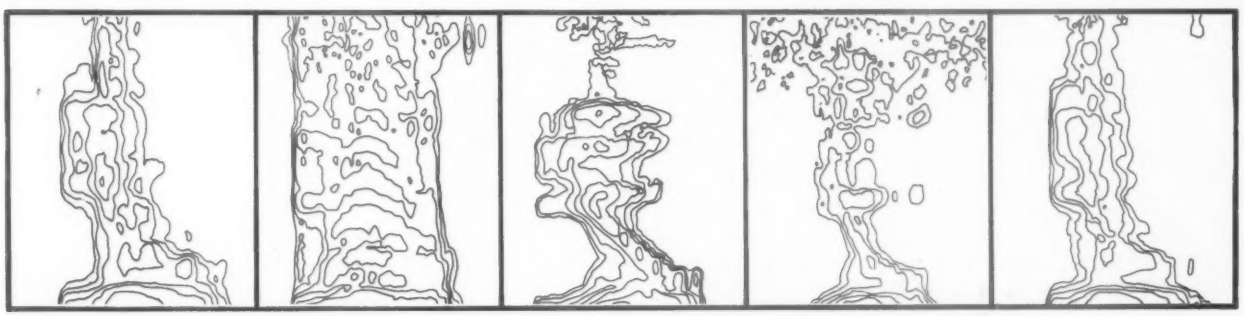
Only a small portion is modified by loss of teeth, tonsils or adenoids, or even by filling the mouth with marbles. And it would be more difficult to surgically alter the throat and nasal passages than to change fingerprints.

Earlier, Kersta served as the master detective on an important case for the U.S. Air Force when he analyzed a voice tape from a C-133 that disappeared at sea. The only clue was some unintelligible noises recorded at the FAA's New York Air Route Traffic Control Center. After digitalizing the sounds, a voiceprint was produced which ultimately allowed Kersta to determine three words: something like "buff," and "prop struck."

MATS officials deduced after careful analysis that the plane was severely buffeted and a propeller had flown off and struck the fuselage of the plane.

MATS commander, Gen. Joe W. Kelly, told Kersta his analysis "presents a major 'first' in the field of Air Force aircraft accident investigation."

Last December the FAA issued a Notice of Proposed Rule Making to require commerical aircraft to install equipment to record comments made by anyone within the cockpit.



These five voiceprints were made by four different speakers saying "you." Which two are by the same speaker? The ones on the extreme left and right.

The tests conducted on the *King Air* at the Beech Aircraft Corp. went beyond the formal requirements set out by FAA safety regulations. Here load trials are condu

KING AIR RECEIVES FAA CERT

The Beechcraft *King Air* (cover) is the latest executive-type airplane to be certificated by the FAA.

The pressurized, twin turbine-powered business aircraft which seats from six to eight persons, was formally certificated on May 27, at the Beech Aircraft Corp. plant at Wichita, Kans. FAA Central Region Director John M. Beardslee presented the type certificate for the *King Air* to company president, Mrs. Olive A. Beech, while several hundred guests looked on.

The FAA certification confirmed the fulfillment of FAA safety requirements of the newly-designed aircraft.

Certification was made under the delegation option (DOP) in which the manufacturer determines compliance with the regulations and the FAA makes a check of this compliance during the certification program. Some of the FAA examinations made during the process include the overseeing of structural tests, basic load analysis, power plant installation and a recheck of a series of ground and flight tests.

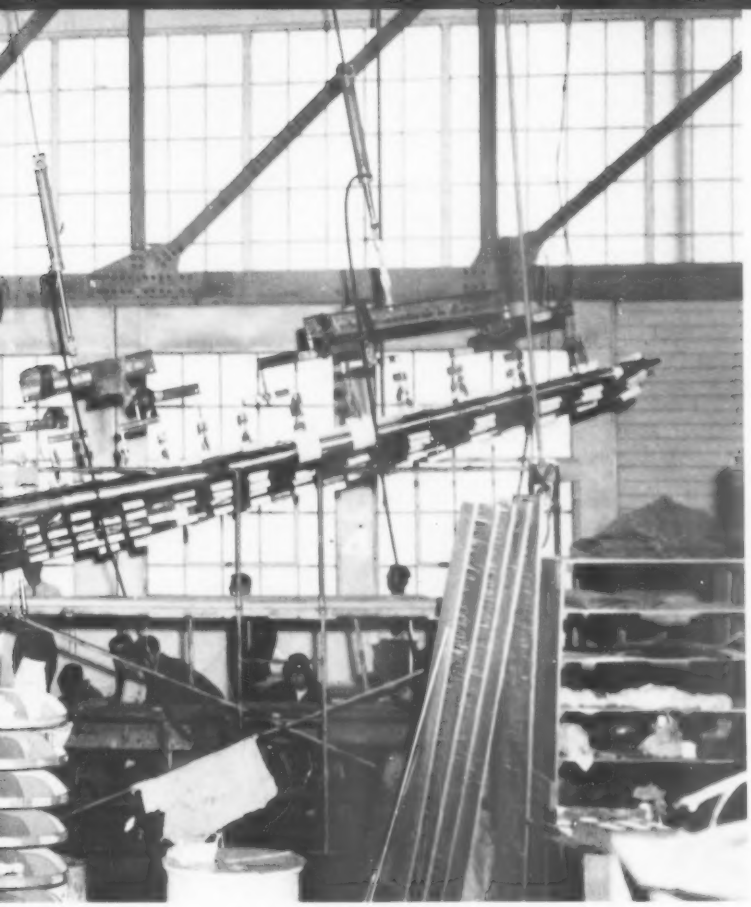
Under DOP, type, production, and airworthiness certification of airplanes having a maximum weight of less than 12,500 pounds are accomplished by manufacturers utilizing a DMCR—a Designated Manufacturer's Certification Representative. Beech engineer C. A. Rembleske served as the FAA DMCR for the *King Air*.

(Under a standard certification procedure, employees of the FAA, rather than a DMCR, would conduct the necessary inspections, examinations and tests.)

The new *King Air,* which will be available in September, was first flown on Jan. 20, 1964. This summer, Beechcraft's first five *King Airs* will be flown on extensive field reliability study programs covering the airframe, the powerplant and the various systems.

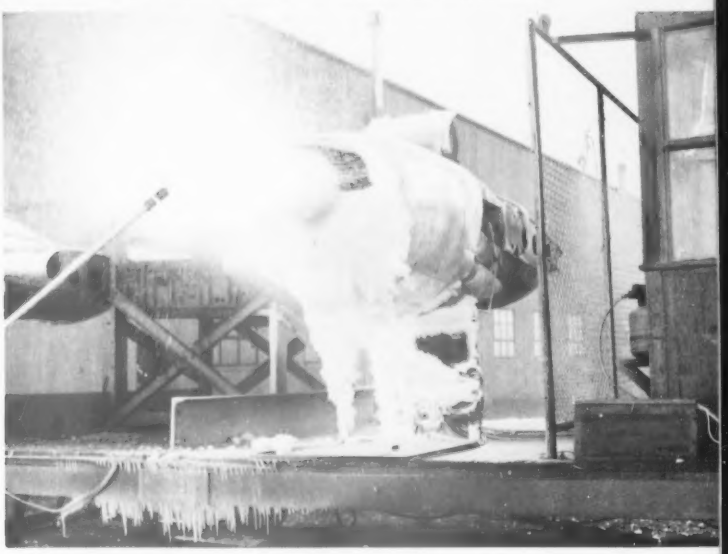
The *King Air* is equipped with two Pratt & Whitney PT6A-6 turboprop engines which can use either gasoline or jet fuel. Its maximum range is more than 1,600 miles, with allowances for taxi, climb-to-altitude, and a 45-minute fuel reserve. The pressurization system provides an 8,000-foot cabin altitude while the airplane is cruising at 16,500 feet.

Beech Aircraft Corp. said it will produce 14 units by the end of 1964, and between 50 and 60 in 1965.



conducted to prove the strength of the plane's wing structure.

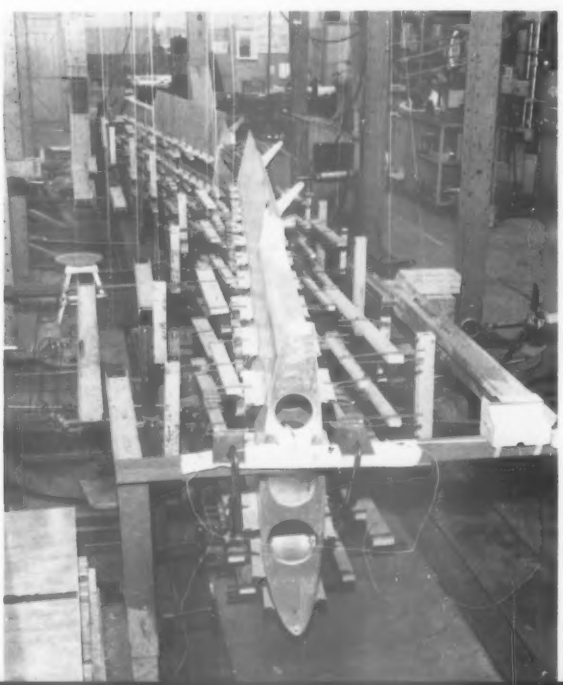
Above—Short "tufts" are temporarily mounted on the wing area to determine inflight airflow over the wing surface. Below—Engine performance under icing conditions is checked for dependability.



Fatigue tests like this are conducted to show the effect of repeated loads.

RTIFICATION

The aircraft is suspended on springs to perform vibration studies.



Lake Hood and Lake Spenard are joined by a 2,000 foot channel. Lined with runway lights, it serves as a sealane for floatplane operations at night.

LAKE HOOD, ALASKA—WORLD'S BUSIEST

The busiest floatplane site in the world—Lake Hood Airport—next to Anchorage International Airport, has one-fourth of all the floatplanes registered in the United States, logging more than 41,000 landings and takeoffs annually.

Its two lakes, Hood and Spenard, joined by a 2,000 foot channel, give the appearance of a slightly misshapen barbell.

Normally, more than 300 floatplanes line the banks of the lakes, forming a continuous fringe. Tie-down positions have long been at a premium, with a waiting list numbering in the hundreds. Alaska's large number of lakes and waterways, plus its lack of highways, account for this great concentration.

Hundreds of floatplanes such as the Piper *Super Cruiser* are moored on the banks of the two lakes. Chugach mountain range is in the background.

A history of floatplane aircraft unfolds along the two lakes. Amid bright new Cessnas and Pipers are such old timers as a single-engine, seven-place *Travel Air, circa* 1929, a Curtiss *Robin* 1928, a Stinson SRJR 1929 and numerous other types of seasoned floatplanes.

Operations rarely cease at this busy capital for floatplanes —a distinct type of seaplane in that they are landplanes equipped with floats. In addition to the almost constant movement of privately-owned planes, air taxi operators offer flights to sportsmen who have the urge to hunt at duck flats or to fish at fast-moving streams where rainbow trout, Dolly Vardens, or graylings beckon.

During the winter months, the chain remains unbroken. The floatplanes convert to skis and continue operations.

At night when most floatplanes normally cease, Lake Hood's lighted sealane permits around-the-clock operations. The 2,000 foot channel between the lakes is lined with runway lights providing the floatplane operators with civil aviation's only lighted sealane.

The channel connecting the lakes was dug in 1937. It gave the area fliers 5,000 feet of waterways from which to operate, compared to a maximum of 1,800 feet on either lake before the excavation.

When floatplane traffic became heavy in the early '50s, a surplus Air Force tower was dismantled at Yakutat, Alaska, and shipped to Anchorage. Since it went into operation in 1954, the tower has served as the only tower exclusively serving floatplanes.

Having withstood the tremors of the Alaskan earthquake in April, it also serves the airport at Anchorage until that damaged tower can be replaced.

FLOATPLANE CENTER

The large Alaskan floatplane fleet consists of vintage airplanes and such newer models as the low flying Cessna 180 shown over Lake Hood, top right. W. K. Landes, lower right, perched on the float of his plane, was a 1963 FAA regional Aviation Mechanics award winner in Alaska for his design of a solid foam float for light aircraft. Maurice Goff, below, maintenance chief of Pacific Northern Airlines, inspects the float on his seven-place 1929 *Travel Air* which he maintains.

Flight Computer: Slide

This article, the fourth in a series on aerial navigation, covers the use of the slide rule face of the computer. The fifth article will outline the use of the wind face side.

An indispensable tool for every pilot, whether he flies a small single engine airplane or a large multijet airliner, is the air navigation flight computer.

Although it has many different names, such as E-6B, Mark 8, etc., its use and importance to the pilot is similar.

The slide rule face of the computer serves the pilot in the same way that a slide-rule or "slip-stick" aids an engineer. It provides a compact and accurate device which can be used to find instant answers to mathematical problems.

A computer's slide rule is a handy device in the air and on the ground. During preflight planning, the pilot uses the computer to help him plan a cross country flight.

He is able to solve navigational problems involving time, distance, fuel consumption, speed, airspeed and altitude corrections. He can use the instrument for nautical, statute and kilometer conversions, and for general multiplication and division problems.

The slide rule has three scales on its face (*illustration #1*): The *miles* scale is the outer scale and lies on the fixed portion of the computer, the *minutes* scale is in the middle and the *hours* scale is the inner scale. Both minutes and hours scales lie on the rotatable disk. In addition, the outer scale, although marked to indicate hours, can also be used to represent gallons of fuel and true airspeed. The hours scale is used only to indicate the number of hours.

To become proficient, a pilot should use the computer regularly. Some of the ways the computer can be used are:

1—Finding flight time when ground speed and distance are known.

During preflight planning a pilot can compute his estimated ground speed for a flight based on the forecast of winds aloft and his proposed true course as measured on an aeronautical chart. After computing his ground speed, a pilot can use it with the distance measured on the chart to determine total flight time.

Sample problem: If a pilot maintains a ground speed of 140 mph, how long will it take him to fly 210 miles?

Solution: Using the computer (*illustration #1*), first rotate the minutes scale until the speed index (the large black arrow) falls under 14 on the "miles" scale. The 14 represents 140 mph.

Under 21 (representing 210 miles) on the miles scale, read 90 on the minutes scale. This represents 90 minutes or 1½ hours, which can be read directly from the hours scale.

2—Determining ground speed during flight.

A pilot can determine his ground speed by maintaining constant heading and power setting, and measuring the time and distance between two checkpoints. Using the time and the distance flown, a pilot can figure his ground speed.

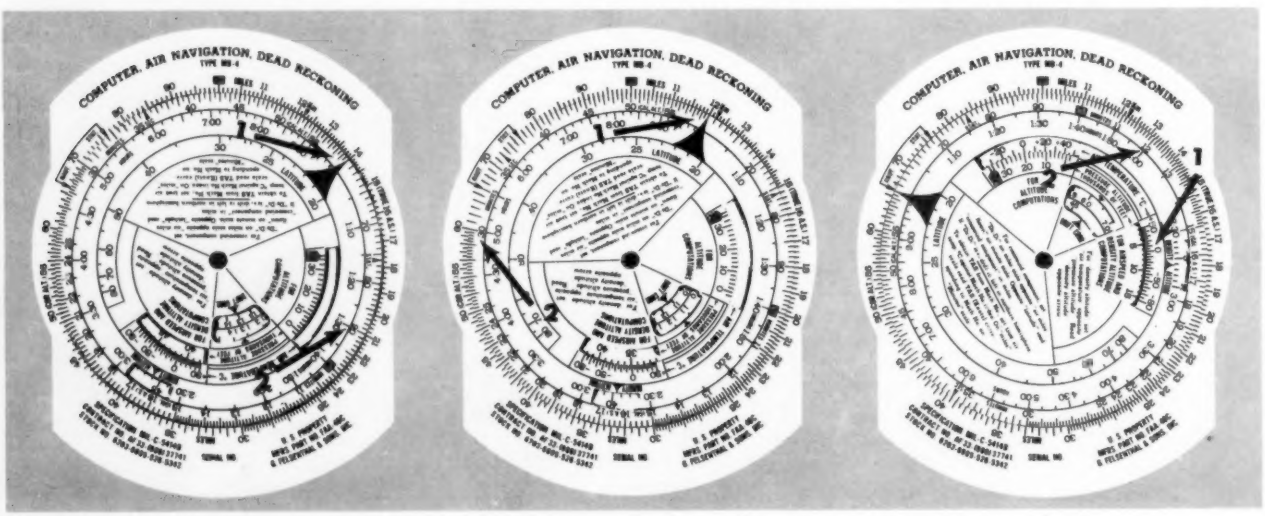
Sample problem: If a pilot flew 21 miles in 9 minutes, how many miles will be flown in one hour?

Solution: On the computer (*illustration #1*), rotate the minutes scale until the 90 (which in this case represents 9) on this scale appears directly under the 21 on the miles scale. On the miles scale, opposite the speed index (the large arrow), read 14, which represents the answer—a ground speed of 140 mph.

3—Fuel consumption problems.

These problems can be solved on the slide rule side in the

Illustration #1 Illustration #2 Illustration #3


COMPUTER, AIR NAVIGATION, DEAD RECKONING
COMPUTER, AIR NAVIGATION, DEAD RECKONING
COMPUTER, AIR NAVIGATION, DEAD RECKONING

Rule Face

same manner that time, distance and ground speed problems are solved. The miles scale in this instance represents gallons and gallons per hour; the minutes scale is still used to represent time.

One type of fuel problem confronting a pilot is to determine total flight time available based on the fuel load.

Sample problem: If an airplane carries 75 gallons of usable fuel and the rate of fuel consumption is 12 gallons per hour, how much flight time is available?

Solution: Rotate the minutes scale (*illustration #2*) until the speed index falls under 12 on the miles scale, representing the fuel consumption of 12 gallons per hour. Under 75 (representing the total amount of fuel, or 75 gallons), read 37½ which represents 375 minutes, or 6 hours and 15 minutes, or the total flight time available.

4—Determining fuel requirements.

If a pilot wants to know how much fuel he will need for a specific flight, the computer can provide a quick answer.

Sample problem: How much fuel will be used during a flight of 5 hours and 20 minutes if the rate of consumption is 12 gallons per hour?

Solution: Rotate the minutes scale until the speed index falls under 12 on the miles scale (*illustration #2*). Opposite 32 (representing 320 minutes) on the minutes scale, read 64 on the miles scale. Here, 64 represents 64 gallons, the amount to be used on the flight.

5—Determining actual fuel consumption.

During flight a pilot is able to check his actual fuel consumption by noting the time it takes to consume the fuel in a particular fuel tank.

Sample problem: If a pilot checks his actual fuel consumption during flight and finds that he has used 30 gallons of fuel in a 15 minute period, what is his rate of fuel consumption?

Solution: On the miles or gallons scale of the computer (*illustration #2*), the pilot locates 30 representing 30 gallons of fuel consumed. Then he rotates the inner wheel until 15 appears on the minutes scale opposite 30 on the outer scale. His answer appears opposite the speed index pointer: 120 gallons per hour is his rate of fuel consumption.

6—True airspeed problems.

Knowing the altitude, temperature and indicated airspeed, a pilot can determine the true airspeed on the computer using the inner window labeled "For Airspeed and Density Altitude Correction" (*illustration #3*).

Sample problem: What is the true airspeed of an airplane flying an indicated airspeed of 120 mph at an altitude of 5,500 feet with an outside air temperature of +10°C?

Solution: On the computer, locate +10°C (*illustration #3*) on the small scale marked Air Temperature C°. Rotate the disk until 5,500 is directly under 10. Opposite 12 (representing 120 mph) on the minutes scale, read 132 on the miles scale. This represents a true airspeed of 132 mph.

7—Altitude corrections.

To obtain true altitude with the computer in the section marked "for altitude computations" (*illustration #3*), a pilot must know his air temperature, the pressure altitude and indicated altitude. He obtains a pressure altitude recording by setting 29.92, the standard pressure setting, in the altimeter correction window. Normally, the correction window would indicate the altimeter setting (pressure reading) for the area which he obtains by radio from a ground station.

Sample problem: Find the true altitude when the indicated altitude is 21,600 feet, the air temperature is −6°C., and the pressure altitude is 22,000 feet.

Solution: Rotate disk on the computer until the figure representing 22,000 feet of pressure altitude on the scale is opposite the marking on the scale representing −6°C. Then opposite the figure on the minutes scale, representing indicated altitude of 21,600 feet, read true altitude or 23,390 feet on the miles scale.

8—Converting nautical miles, statute miles, kilometers.

The conversion of nautical miles, statute miles or kilometers can be accomplished on the computer. Three indices are located on the outer or miles scale: "Naut" and "Stat" are located on the outer ring near the 70 on the scale, and "Km" is found near the 12 on the same scale.

Sample problem: Convert 60 nautical miles (or knots) to statute miles (or miles per hour) and to kilometers (or kilometers per hour).

Solution: Rotate the inner minutes scale (*illustration #3*) until 60 appears under the "Naut" arrow. Then under the "Stat" arrow, read 69 statute miles (or miles per hour), and under "Km" arrow read 111 kilometers (or kilometers per hour). By reversing the process, the pilot can convert any one of the standards to the other.

SAFETY FIRST

Landing An Airplane

The most troublesome aspect of flying, if statistics are indicative, is landing an airplane.

Recent reports indicate that more than half of the general aviation accidents reported occur during landing.

The studies further show that the majority of accidents reported involve faulty flying techniques. They include:

- Improper operation of brakes or controls on the ground.
- Selection of unsuitable terrain. (*See back page.*)
- Overshooting or undershooting landing areas.
- Improper level-off techniques.
- Failure to extend landing gear or inadvertent retraction.

Generally, the accidents reported have shown that violations of the most rudimentary fundamentals of flight technique have caused a large number of accidents.

Inattention, or on the other hand tenseness, as well as improper techniques during the landing procedure, are probably the greatest contributing factors in these landing accidents. Relying heavily on memory and a know-it-all attitude, rather than following a precise check list, has directed many an aircraft to the junk pile. To illustrate, a recent CAB accident summary stated:

"When the pilot . . . extended the landing gear before landing he withheld the flap extension. Thereafter, intending to extend the flaps, he inadvertently retracted the landing gear instead. The plane landed wheels up. The pilot stated that diversion of his attention was a factor causing him to inadvertently retract the gear. He said the source of his diversion was another aircraft on the runway. He was watching to see if it would clear the runway so he could land."

One of the best ways to improve landing techniques is to take some recurrent training or have check rides with a current, qualified Certificated Flight Inspector (CFI). Just as one consults a "pro" to solve a hook or slice in golf, or a ragged wedeln technique in skiing, it is best to consult a professional or CFI to improve his landing techniques. A little time may save a lot of grief.

Taking a periodic check ride can also prove to be one of a pilot's wisest moves. Not only will the ride with a CFI provide the pilot with ideas to improve his flying technique, it may also help him develop the confidence he needs to fly safely every time. Even captains of airline fleets with more than a million flight hours to their credit have found that mandatory check rides are very helpful.

The FAA General Aviation District Officer (GADO) inspector is also available to help a pilot with his flying problems. Because the GADO inspector has his finger on the pulse of general aviation, he can be an invaluable aid to the general aviation aviator. He will be glad to provide the pilot with a list of CFI's in the area who are current and qualified in the proper type of aircraft.

Other landing pointers include:

- Know the limitations of the aircraft. Don't expect the airplane to do things it was never designed to do.
- Remember your landing limits. Plan ahead.
- Abort a landing if not solidly "on" the first one-third of the runway, or the first one-fourth if landing on wet grass runways.
- Never relax controls until the engine is shut down and the wheels are blocked.

During an approach for landing, it is advisable to use a speed which gives the pilot a relatively slow rate of descent and at the same time provides a sufficient safety margin above stalling. The speed recommended for an approach is 130 per cent above stalling over the end of the runway; under gusty conditions, slightly higher.

Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

● Career Opportunities

During a tour with the U.S. Marine Corps, I spent two and a half years in flight operations as a clerk keeping track of all inbound, outbound and locally filed flights and also handled the radio telephone. I would like to pursue this occupation in civilian life. How can I get information about this field?

Mary Ann Abrahamson
Oakland, Calif.

A booklet outlining airline career opportunities may be obtained by writing the Public Relations Department, Air Transport Association of America, 1000 Connecticut Ave., N.W., Washington, D. C.

If you are also interested in a position as an FAA air traffic control tower operator in the Western Region, or as an FAA air route traffic controller, we suggest you write to the Executive Secretary, Board of Civil Service Examiners, 5651 West Manchester Ave., Box 90007 Airport Station, Los Angeles, Calif., 90009, for information on examinations for these positions.

● Gyroplane Certification

Has the FAA issued a special regulation allowing nonpilots to obtain pilot licenses in their own gyrocopters without having to take dual instruction in either airplanes or helicopters? If so, what are the regulations? Is there a regulation for licensing persons to fly only gyrocopters? What are the procedures for obtaining such a license? And, finally, what type of test is given for a person to qualify?

Pvt. John Allman
APO 189, New York

FAR Section 61.63, effective last month, slightly amends Special Regulation SR-451 which relates to flying gyroplanes. It contains several points; one permits the holder of a flight instructor certificate, airplane category, to issue the "solo" endorsement on a student pilot certificate in gyroplanes after observing the student pilot make certain towed flights in a gyroglider or gyroplane, and otherwise finding him competent to operate an aircraft in solo flight.

This regulation establishes procedures for an individual to solo and operate rotorcraft —gyroplanes only.

Application for issuance of a student pilot certificate may be made to any FAA General Aviation District Office or Flight Standards District Office. Eligibility requirements for student pilots are covered in FAR, *Part 61, Section 61.6.*

The type of test for a person to solo a gyroplane is covered in FAR, *Part 61, Section 61.63 and SR-451. The type of test for a Private Pilot, Gyroplane, is outlined in the* Flight Test Guide—Gyroplane—Private Pilot.

● Glider Club

Attempts are being made to form a glider club at West Virginia Wesleyan College at Buckhannon, W. Va., where I am a student. We are planning to build a glider which would be propelled initially by an automobile tow and not by an airplane. Is a special license necessary to pilot such a vehicle? And are there any regulations covering this subject?

Calvin F. Carstensen
Buckhannon, W. Va.

If you operate a glider in free flight, released from its towline, the glider must be registered as an aircraft and have a valid airworthiness certificate, and the pilot must hold at least a Student Glider Pilot Certificate endorsed for solo flights.

To qualify for a Student Glider Pilot Certificate, the applicant must be at least 14 years of age, certify that he has no known physical defects which render him incompetent to pilot gliders, and make application on an FAA form. Any pilot certificate valid on powered aircraft gives student pilot privileges in a glider.

For additional information, we suggest you contact your local FAA General Aviation District Office, before construction is begun on your glider. FAA inspectors will be pleased to provide guidance on the procedures for certificating your proposed glider and assistance in obtaining any necessary pilot certificate.

● Certificate Reciprocity

What is the status of a flier from France who holds a French and English pilot's certificate? Would obtaining a U.S. citizenship change his status?

Is there a reciprocal agreement with either country which would authorize the permanent exchange of one license for another?

Is there such a thing as an international license? How is it obtained?

Erik C. Paul
Minneapolis

The Federal Aviation Agency does not issue pilot certificates on the basis of reciprocity. However, you may obtain a U.S. pilot certificate on the same basis as a citizen of the United States.

As a foreign national, you are eligible to apply for a Special Purpose Pilot Certificate on the basis of the pilot certificate and ratings issued you as a citizen of France. This certificate would enable you to pilot U.S. registered aircraft within the United States.

However, should you become a U.S. citizen you would no longer be eligible to hold a Special Purpose Pilot Certificate, but would be required to hold a U.S. pilot certificate to pilot U.S. registered aircraft within the United States. We are not aware of an international pilot license.

● Civil Aviation Statistics

Does your Agency have statistics on commercial airlines, military, business and private aircraft registrations, the air and passenger miles flown and the safety record for the years 1962 and 1963? How may I obtain this data?

Paul J. Ripple
West Bend, Wis.

The 1962 and 1963 editions of the FAA Statistical Handbook of Aviation, *available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402, for 65 cents each, contain the statistics you request on civil aviation. We do not publish data on military aircraft and suggest you consult the Department of Defense.*

● Cabin Exhaust Fumes

I have noticed that when there are a number of aircraft waiting for take off, one behind the other, there is, at times, a very strong smell inside the cabin such as kerosene that has already gone through the combustion state. I believe that the exhaust of the aircraft that is in front works its way into the cabin of the one in back through the pressurization system. A number of aircraft have crashed recently after takeoff for no apparent reason. I wonder whether the large exhaust volume of jets, as compared to piston aircraft, could cause a high concentration of carbon monoxide in the cabin of the aircraft directly behind if neither moved position for some time. If the concentration is high enough, could it conceivably impair the faculties of the crews?

Ramon Valdes
San Juan, Puerto Rico

Contamination of cabin air by exhaust fumes from aircraft has been investigated by the FAA. The possibility of sufficient concentration of fumes to constitute dangerous levels is slight. Various safety measures are taken by airlines and other operators to prevent crew incapacitation from this source, such as the use of oxygen when the fumes are detected by the crew. Once the source of the exhaust is removed from the immediate vicinity of the affected aircraft, the large volume of air utilized in modern pressurization systems rapidly flushes any impure air from the aircraft.

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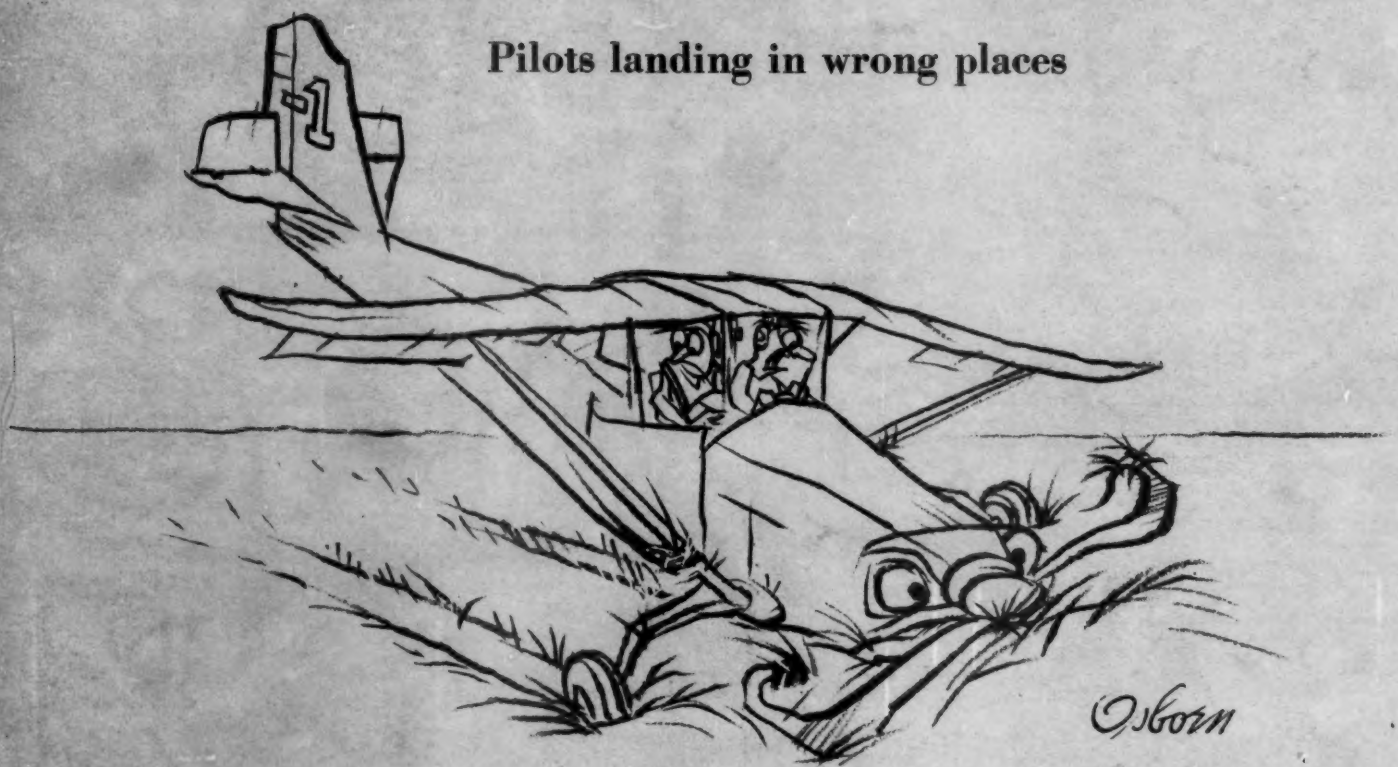
Pilots landing in wrong places



Often end up on their faces.